

REMARKS

Applicants request favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Initially, Applicants note a minor informality on page 2, point 1, of the above-noted Office Action. Specifically, the Examiner indicates that Applicants' submission on "July 17, 2003" has been entered. That date, however, should be -- June 17, 2003 --.

Claims 1-11 and 16-22 are presented for consideration. Claims 1, 17 and 22 are independent. Claims 16-22 have been added to recite additional features of the subject invention. Support for these claims can be found in the original application, as filed. Therefore, no new matter has been added.

Applicants request favorable reconsideration and withdrawal of the objection and rejections set forth in the above-noted Office Action.

The drawings were objected to on formal grounds. Specifically, the Examiner asserted that it is not clearly understood how the pressure sensor (20) can perform its functions as claimed and described in the specification such as detecting the pressure inside the chamber (14), while it is positioned inside the projection optical system (13) and the projection optical system is substantially sealed. Claims 1-11 were rejected under 35 U.S.C. § 112, second paragraph, essentially on this basis. These assertions are respectfully traversed. Notably, Applicants submit that one having ordinary skill in the art would readily understand the operation of the pressure sensor 20 when read in light of the subject specification and drawings. Therefore, Applicants request reconsideration and withdrawal of this objection and rejection.

In more detail, Figure 1 shows an arrangement of an exposure apparatus in which a projection optical unit 13 is shown as being an internal unit contained within the chamber 14. The pressure sensor 20 is disposed in the projection optical unit. As discussed on page 10 at line 17 of the specification, corresponding to these features in Figure 1, Applicants intend the phrase “the value of pressure inside the chamber 14” to mean -- the pressure value of an internal region contained inside the chamber 14 --. That is, as long as the position where the pressure sensor 20 is disposed is inside of the chamber 14, the pressure sensor 20 can be disposed anywhere inside the projection optical unit 13 (see, for example, Figures 1 and 3), or outside of the projection optical unit 13. In order to maintain a relation of a predetermined pressure to a pressure detected by a pressure sensor 14, the pressure value of the internal region contained inside the chamber 14 is measured. Figures 1 and 3 show a state in which the pressure sensor 20 is disposed in the projection optical unit, as being one example of the internal region.

For the reasons noted above, Applicants submit that one having ordinary skill in the art would readily understand the operation of the pressure sensor 20, for example. Therefore, Applicants request favorable reconsideration and withdrawal of the objection to the drawings and the rejection under 35 U.S.C. § 112, second paragraph.

Turning now to the art rejections, claims 1-8, 10 and 11 were rejection under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,266,133 to Osakabe in view of U.S. Patent No. 6,133,981 to Semba and further in view of Japanese patent document number 5-210049 to Aoki. Claim 9 was rejected under 35 U.S.C. § 103 as being unpatentable over this art combination and further in view of U.S. Patent No. 6,356,338 to Arakawa. Applicants submit that the cited art,

whether taken individually or in combination, does not teach many features of the present invention, as recited in claims 1-11, for example. Therefore, these rejections are respectfully traversed.

In one aspect of the invention, independent claim 1 recites, among other features, at least one chamber for internally accommodating an illuminating optics unit, a reticle stage, a projection optics unit, and a substrate stage, first pressure control means for making a value of pressure inside the at least one chamber higher than a value of pressure outside the at least one chamber, and first correction means for correcting optical characteristics of the projection optics unit, by performing at least one of (i) moving an adjustment unit for adjusting the optical characteristics of the projection optics unit and (ii) shifting a wavelength of the exposing light, in accordance with the value of the pressure inside the at least one chamber.

Applicants submit that the cited art does not teach or suggest such features of the present invention, as recited in independent claim 1.

The Osakabe patent discloses a device for transporting an apparatus safely, without being dependent on a change in environmental conditions, such as temperature and pressure at the time of transportation. The apparatus, for example, an exposure apparatus, is disposed inside an enclosure. A pressure absorber adjusts the differential pressure of the inside and outside of the enclosure, in order to maintain the gas-tight environment formed inside the enclosure.

The Semba patent discloses a processing system provided with an apparatus which performs thermal processing, for example, to a wafer. In order to prevent an atmosphere of the processing system from flowing into the connected exposure apparatus, the system maintains the

inside pressure of the exposure apparatus higher than a pressure of a coating unit or a pressure of a developing unit.

The Aoki document discloses an exposure apparatus that sets up a mixture ratio of helium and nitrogen gas that is supplied to a projection optical unit based on an environmental sensor 21, which detects the temperature and pressure in the exposure apparatus. The pressure sensor is formed in the projection optical unit and the temperature sensor is formed in the projection optical unit.

The Arakawa patent discloses load-lock chamber as a subsystem for exhausting a gas-like chemical substance in a section that connects an exposure apparatus and a coating/developing system.

Applicants submit, however, that the cited art does not teach or suggest the salient features of Applicants's present invention as recited in independent claim 1, for example. In this regard, the Semba patent discloses an arrangement in which an internal pressure of a chamber is set to be higher than an external pressure of the chamber. That patent, however, is silent regarding any features for correcting optical characteristics of a projection optics unit in the manner of the present invention recited in independent claim 1.

The remaining art cited likewise does not teach or suggest such features of the present invention. Therefore, that art adds nothing to the teachings of the Semba patent that would render obvious Applicants' present invention recited in independent claim 1.

Applicants further submit that the cited art does not teach or suggest the salient features of Applicants' present invention as recited in independent claims 17 and 22, for example.

Specifically, that art does not teach or suggest an exposure apparatus or a method of manufacturing a semiconductor device in which a chamber surrounds a projection optical system, wherein a value of pressure inside of the chamber is set to be higher than a value of pressure outside of the chamber, a pressure sensor measures the value of pressure inside the chamber and adjusting means performs at least one (i) moving an adjusting unit disposed in a projection optical system and (ii) shifting a wavelength of light emitted from a light source. Therefore, those claims likewise should be deemed allowable.

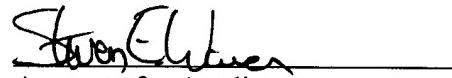
For the foregoing reasons, Applicants submit that the present invention, as recited in independent claims 1, 17 and 22, also is patentably defined over the cited art.

Dependent claims 2-11, 16 and 18-21 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicants further submit that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the objection and rejections set forth in the above-noted Office Action and an early Notice of Allowance are requested.

Applicants' attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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